

**GLENDALE SOUTH OPERABLE UNIT
RECORD OF DECISION**

ARO147

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SAN FERNANDO VALLEY AREA 2 SUPERFUND SITE

LOS ANGELES COUNTY, CALIFORNIA

**United States Environmental Protection Agency
Region 9 - San Francisco, California**

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RECORD OF DECISION

GLENDALE SOUTH OPERABLE UNIT INTERIM REMEDY

PART I. DECLARATION

SITE NAME AND LOCATION

San Fernando Valley Area 2
Glendale South Operable Unit
Los Angeles County, California

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Glendale South Operable Unit, San Fernando Valley Area 2 Superfund site, chosen in accordance with CERCLA as amended by SARA and, to the extent practicable, the National Contingency Plan. This decision is based on the administrative record for this operable unit.

In a letter to EPA dated May 28, 1993 the State of California agreed with the selected remedy for the Glendale South OU.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

DESCRIPTION OF THE REMEDY

EPA has selected an interim remedy for the South plume of groundwater contamination in the Glendale Study Area. This interim remedy is referred to as the Glendale South Operable Unit (OU). An OU is a discrete action that comprises an incremental step toward comprehensively addressing Superfund site problems. The remedy and all of the alternatives presented in the feasibility study were developed to meet the following specific objectives for the Glendale South OU:

- o To inhibit vertical and horizontal migration of groundwater contamination in the South Plume of the Glendale Study Area; and
- o To begin to remove contaminant mass from the upper zone of the aquifer in the South Plume of the Glendale Study Area.

The remedy involves groundwater extraction and treatment for the shallow aquifer system in the Glendale area of the San Fernando Valley. Under this remedy, contaminated groundwater will be

extracted at a rate of 2,000 gallons per minute (gpm) for 12 years from new wells to be installed in the South Plume of the Glendale Study Area. The extracted contaminated groundwater will be filtered to remove any suspended solids, if necessary, and then treated by air stripping (single or dual-stage) and/or liquid phase granular activated carbon (GAC) to remove volatile organic compounds (VOCs). After treatment, the water shall meet drinking water standards (maximum contaminant levels or MCLs) for VOCs. If air stripping treatment is selected, air emissions will be treated using vapor phase GAC to ensure that all air emissions meet applicable or relevant and appropriate requirements. The exact number, location and other design specifics of these new extraction wells and air stripping/liquid phase GAC units will be determined during the remedial design phase of the project to best meet the objectives of the remedy. After treatment to remove VOCs, the water will be blended as necessary with an alternative water source of a quality such that the treated, blended water would meet all drinking water standards (including the nitrate MCL). All or part of the extracted treated water will then be conveyed to the City of Glendale or another San Fernando Valley water purveyor for distribution through its public water supply system. Groundwater monitoring wells will be installed and sampled regularly to help evaluate the effectiveness of the remedy.

As a result of comments by the City of Glendale on the Glendale North OU Proposed Plan (July 1992) and Glendale South OU Proposed Plan (September 1992) which indicated that the City had sufficient water credits to accept the treated water from both the Glendale North and Glendale South OUs, and in order to decrease overall costs associated with the OUs, EPA has determined that the treatment plants for the Glendale North and Glendale South OUs will be combined at a single location. The total 5,000 gpm of treated water will be conveyed to the City of Glendale for distribution to its public water supply system. The exact configuration of the combined treatment plant will be determined during the remedial design phase of the project. The Glendale North OU Record of Decision will also reflect this decision to combine the treatment plants.

However, if EPA determines that combining the treatment plants will significantly delay or hinder the implementation of the Glendale South OU, the treatment plants will not be combined. Furthermore, if the City of Glendale does not accept any or all of the treated water (possibly due to water supply needs), any remaining portion of water will be: 1) offered to another San Fernando Valley water purveyor or 2) recharged into the aquifer at the Headworks Spreading Grounds.

The total duration of the Glendale South OU interim remedy will be 12 years. EPA will determine the need for and scope of any further actions every five years throughout this interim remedy period and again at the conclusion of this period.

The remedial action for the Glendale South OU represents a discrete element in the overall long-term remediation of

groundwater in the eastern portion of the San Fernando Valley. The objectives of this interim action (i.e. inhibiting vertical and horizontal migration of groundwater contamination and beginning to remove contaminant mass from the upper zone of the aquifer in the South Plume of the Glendale Study Area) would not be inconsistent with nor preclude implementation of any final, overall remedial action or actions selected by EPA in the future for the San Fernando Valley Areas 1, 2, 3 and 4.

EPA is the lead agency for this project and the Department of Toxic Substances Control of the State of California Environmental Protection Agency is the support agency.

DECLARATION

This interim action is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements directly associated with this action and is cost effective. This action utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, given the limited scope of the action. Because this action does not constitute the final remedy for the site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed at the time of the final response action. Subsequent actions are planned to fully address the principal threats at these sites.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, EPA shall conduct a review, pursuant to CERCLA Section 121, 42 U.S.C. Section 9621, at least once every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

John C. Wise
John C. Wise
Acting Regional Administrator

6.18.93
Date

PART II. DECISION SUMMARY

This Decision Summary provides an overview of the Glendale South OU interim remedy, including a description of the nature and extent of contamination to be addressed and the remedial alternatives, the comparative analysis of the remedial alternatives, a description of the selected remedy, and the rationale for remedy selection.

1.0 SITE LOCATION AND DESCRIPTION

The Glendale Study Area is located within the San Fernando Basin. The following sections present a basin description, regulatory history, and a summary of the Remedial Investigation and Feasibility Study (RI/FS) activities within the San Fernando Valley and the Glendale Study Area.

1.1 Description of the San Fernando Basin

The San Fernando Basin is located within the Upper Los Angeles River Area (ULARA), which consists of the entire watershed of the Los Angeles River and its various tributaries. The San Fernando Basin covers approximately 122,800 acres and comprises 91.2 percent of the ULARA alluvial fill. It is bounded on the north and northwest by the Santa Susana Mountains, on the northeast by the San Gabriel Mountains, on the west by the Simi Hills, and on the south by the Santa Monica Mountains.

The San Fernando Basin is a significant source of drinking water, with an estimated total volume of 3 million acre-feet of groundwater stored in aquifers within the alluvial fill of the basin. The groundwater of the San Fernando Basin has been used as a source of drinking water for more than 800,000 residents within the cities of Los Angeles, Burbank, Glendale, and San Fernando. Groundwater extractions within the San Fernando Basin typically provide 15 percent of Los Angeles' annual average water supply and historically have accounted for between 50 and 100 percent of the water needs of the other cities.

1.2 Description and Background of the Glendale Study Area

The Glendale Study Area is in the vicinity of the Crystal Springs National Priorities List (NPL) Site, one of the four San Fernando Valley Superfund NPL sites, and is adjacent to the Los Angeles River (Figure 1-1). The Glendale Study Area includes two portions of the aquifer where high concentrations of contaminants have been identified: the North Plume and the South Plume (Figure 1-2). Although contamination has been detected throughout the Glendale Study Area in an apparently contiguous plume, differences exist between the North Plume and South Plume, including the types of contaminants detected and the concentrations of the

contaminants. The Glendale North and South Plumes are separated by an area of groundwater with lower concentrations of contamination. The Glendale South OU includes the South Plume of VOC contamination and adjacent areas where contamination is known or believed to have migrated. The Glendale South OU extends south towards the Pollock Operable Unit. Some of the monitoring wells constructed to help define the extent of the Pollock OU are located within the Glendale South OU.

In 1990, an analysis was performed to evaluate the need for an OU within the Crystal Springs NPL site (CH2M Hill, 1990). This analysis included a qualitative comparison based on known groundwater contamination, potential downgradient impacts and water supply. This analysis concluded that there was a need for an OU within the Crystal Springs NPL site because of the: 1) high concentrations of TCE and PCE present in groundwater, 2) critical loss of groundwater production in the Glendale area and 3) potential impact of contaminating groundwater downgradient from the Crystal Springs NPL site. Additional data collection was recommended to more adequately characterize the horizontal and vertical distribution of contamination in the aquifer, and also to improve the definition of the hydrogeology of the area.

EPA conducted a remedial investigation (RI) that characterized the nature and extent of contamination in the Glendale Study Area. Upon completion of the Remedial Investigation Report for the Glendale Study Area (January 1992), a feasibility study (FS) was undertaken for the Glendale South OU which evaluated a range of cleanup alternatives for addressing the contaminated groundwater. The FS report entitled Feasibility Study for the Glendale Study Area South Plume Operable Unit was completed in August 1992.

2.0 SITE HISTORY

In 1980, after finding organic chemical contamination in the groundwater of the San Gabriel Valley, the California Department of Health Services (DHS) requested that all major water purveyors using groundwater in the San Fernando Valley conduct tests for the presence of certain industrial chemicals in the water they were serving. The results of initial tests and of subsequent testing revealed the presence of volatile organic compound (VOC) contamination in the groundwater of the San Fernando Valley. These findings resulted in a number of municipal supply wells for the cities of Los Angeles, Burbank, and Glendale being taken out of service. The primary contaminants of concern were and are the solvents trichloroethylene (TCE) and perchloroethylene (PCE), which have been widely used in a variety of industries including machinery degreasing, metal plating and dry cleaning.

In 1984, EPA proposed four sites within the San Fernando Valley for inclusion on the NPL and in 1986 the sites were added to

the list (Figure 2-1). Each site encompasses an area in which production wells produced groundwater containing concentrations of TCE and PCE above State and Federal standards in 1984. The four NPL sites in the San Fernando Valley are the North Hollywood, Crystal Springs, Verdugo, and Pollock sites, also referred to as San Fernando Valley Areas 1, 2, 3, and 4, respectively. The EPA has now shifted from defining the sites based on production wells to managing it as one large site defined by the extent of the contaminated plume of groundwater. The San Fernando Valley Study Area includes the four sites as listed on the NPL and adjacent areas where contamination has or may have migrated. A basinwide groundwater RI report for the San Fernando Valley Study Area was completed in December 1992. Groundwater wells installed by EPA as part of the basinwide groundwater RI are routinely sampled to continue to monitor the nature and extent of the groundwater contamination in the San Fernando Valley. In addition, monitoring well data gathered at individual facilities in the San Fernando are included in the EPA database which is used to generate plume maps of the basin.

EPA has previously signed Record of Decision (ROD) documents for two OUs in the San Fernando Valley: the North Hollywood OU (1987) and the Burbank OU (1989). The North Hollywood OU interim remedy is currently operating and the Burbank OU is in the remedial design phase. In the Glendale Study Area, EPA has identified two OUs: the Glendale North Plume OU and the Glendale South Plume OU. In addition, EPA has recently initiated an RI/FS for an OU in the Pollock area of the San Fernando Valley. All of these OUs represent interim cleanups currently in progress throughout the eastern portion of the San Fernando Valley. All remedial actions established by EPA thus far in the ROD for each OU have been interim measures. EPA has not yet selected a final remedy for the entire San Fernando Valley.

The most prevalent groundwater contaminants in the Glendale Study area are TCE and PCE. In 1992, the highest concentrations of TCE and PCE detected in EPA monitoring wells in the San Fernando Valley were 7100 ppb and 160 ppb, respectively. Groundwater samples from wells installed at industrial facilities in the San Fernando Valley near potential sources of contamination have shown concentrations greater than 30,000 ppb for TCE and over 15,000 ppb for PCE. The maximum levels of 820 ppb of TCE and 220 ppb of PCE were detected in shallow wells located in the south plume portion of the Glendale Study Area. The MCL for both TCE and PCE is 5 ppb.

Nitrate, an inorganic contaminant, has been detected consistently at levels in excess of the MCL (45 milligrams per liter (mg/l), also referred to as parts per million (ppm) as nitrate, or 10 mg/l nitrate as nitrogen) in the groundwater of the Glendale Study Area. The nitrate contamination is likely to be the result of past agricultural practices and/or septic systems in the San Fernando Valley.

SAN FERNANDO VALLEY SUPERFUND SITE

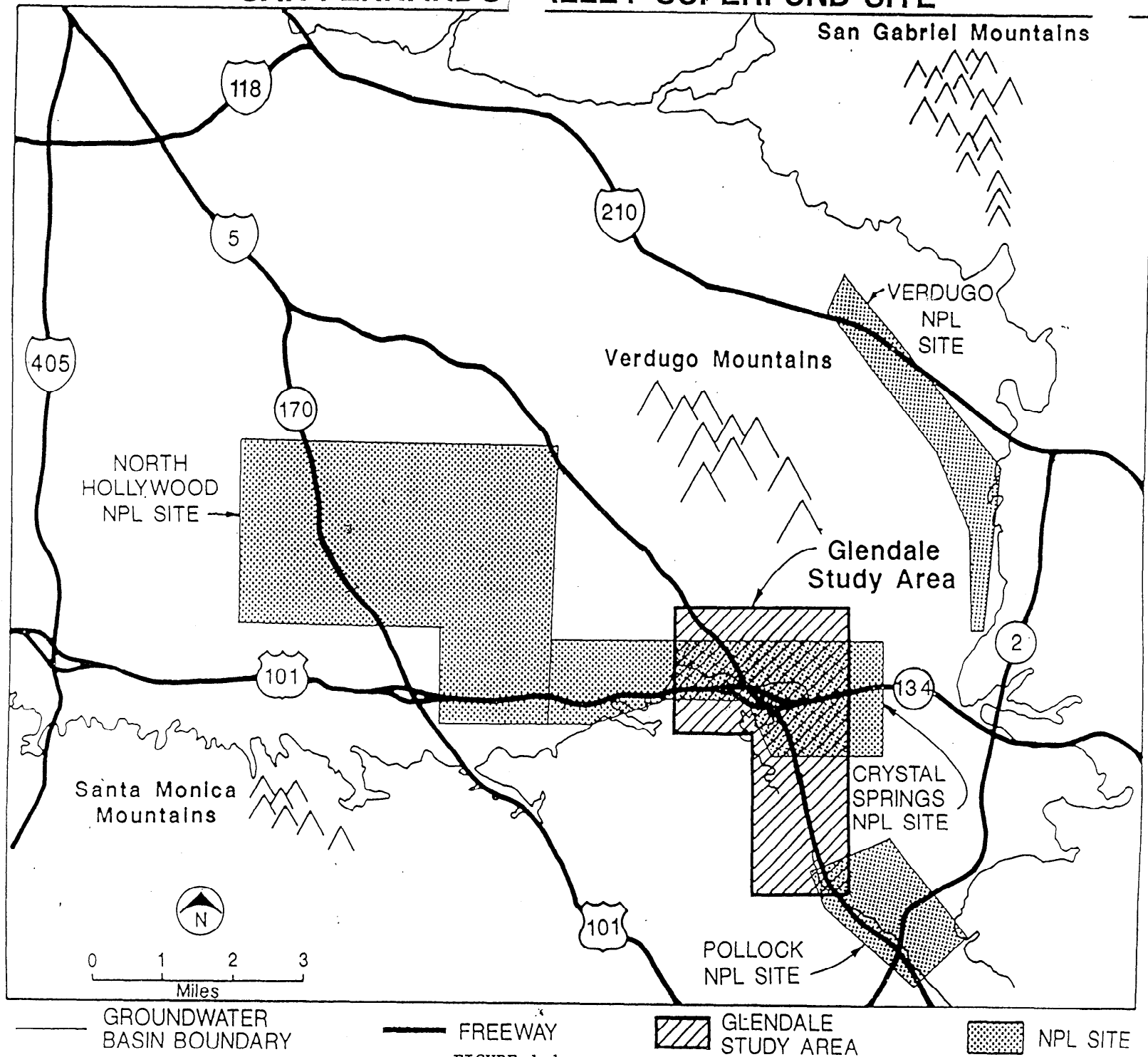
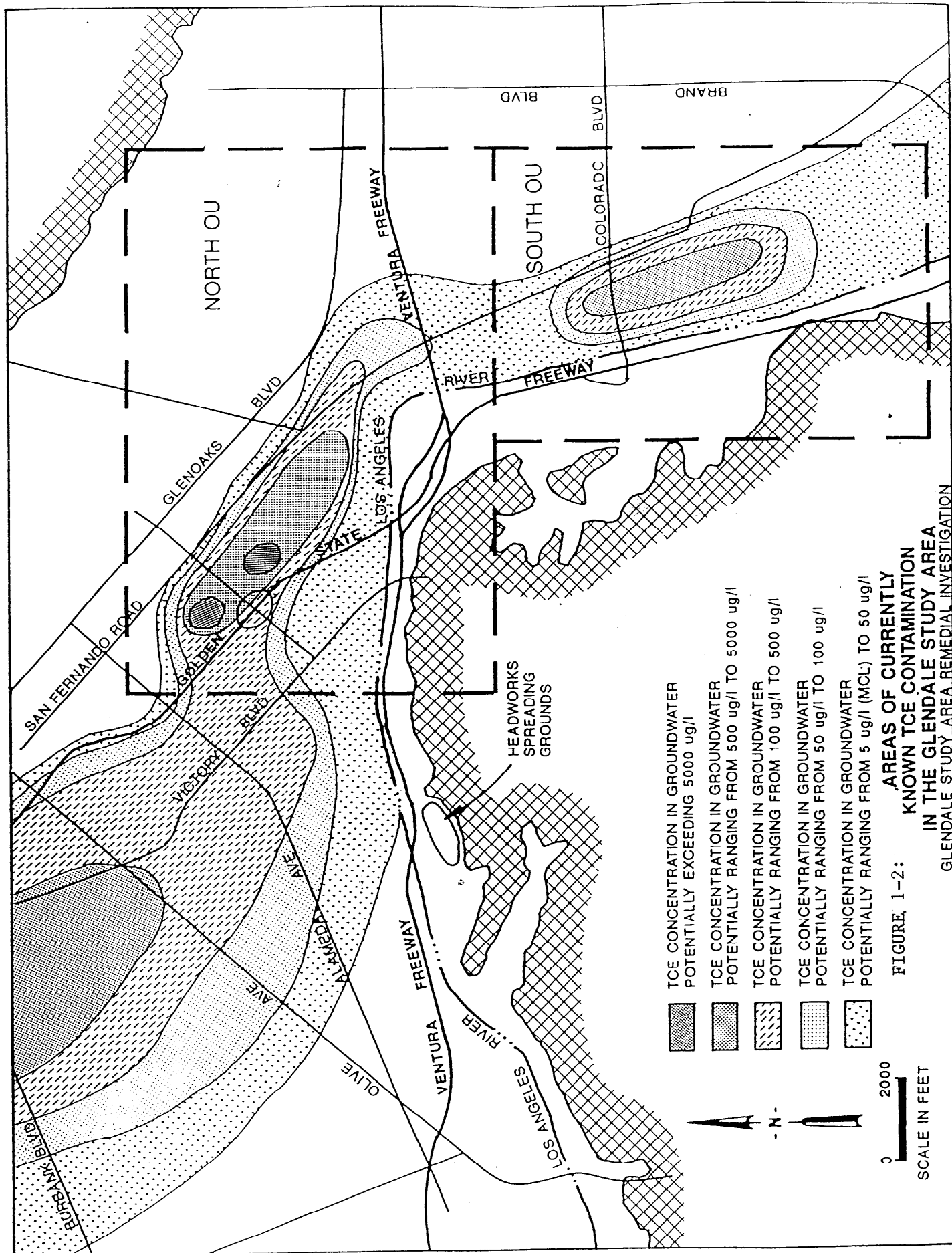
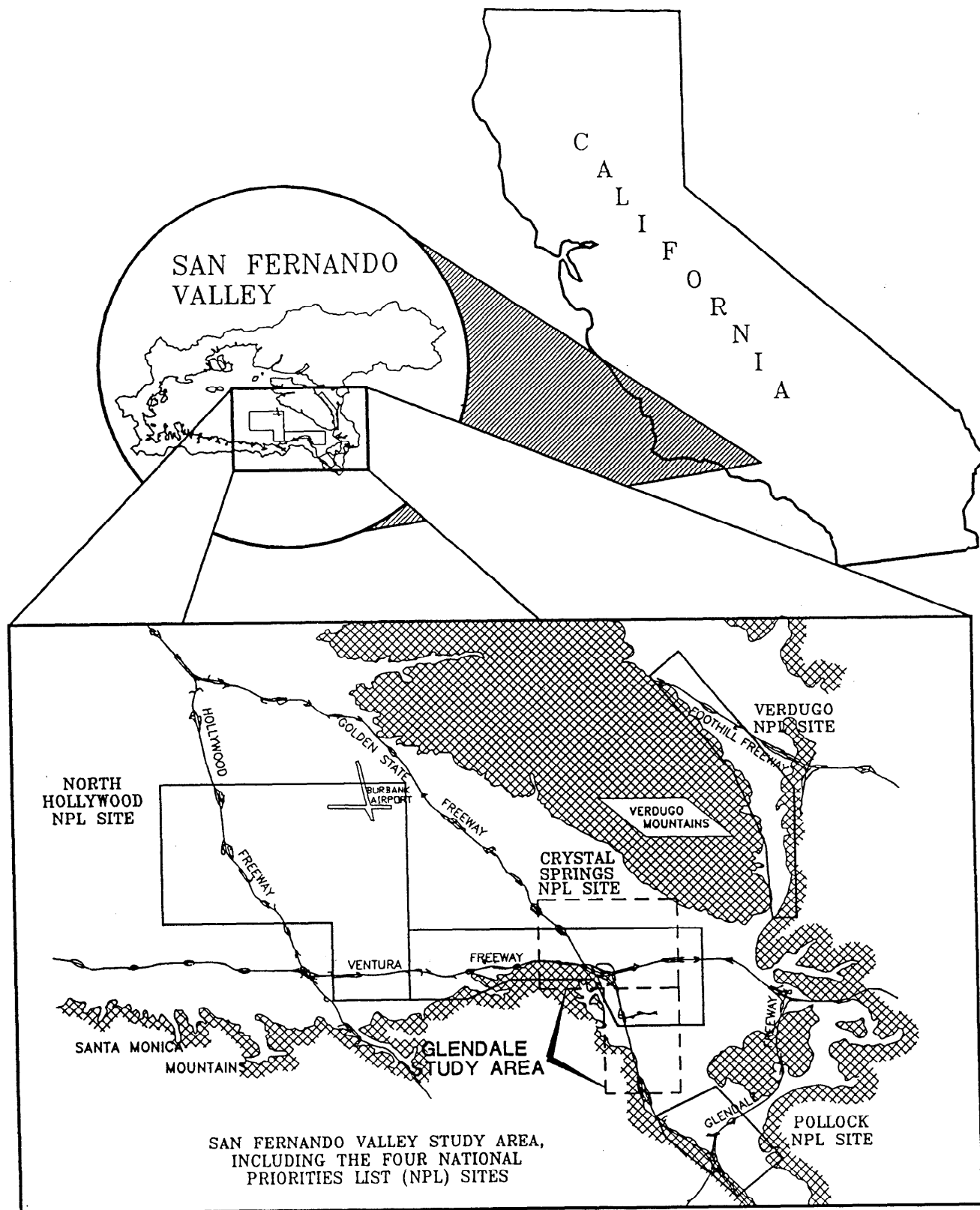


FIGURE 1-1





GLENDALE STUDY AREA

FIGURE 2-1
SITE LOCATION MAP

It should be noted that the Cities of Glendale and Los Angeles closely monitor the quality of drinking water delivered to residents. The water served to residents must meet all Federal and state drinking water requirements. Currently, nearly all of the water delivered by the City of Glendale is purchased from the Metropolitan Water District (MWD) of Southern California. The City uses a limited amount of groundwater from a small percentage of its nine production wells in the San Fernando Valley. If the levels of VOCs and other contaminants detected in the groundwater of production wells are equal to or less than 10 times MCLs, the State of California Department of Health Services, Office of Drinking Water permits the City to extract the water, blend it with MWD water to meet all drinking water standards, and convey the extracted, blended water to its public distribution system.

As described briefly in Section 1 above, the Glendale Study Area includes two portions of the aquifer where high concentrations of contaminants have been identified: the north plume and the south plume. A remedial investigation (RI) that characterized the nature and extent of contamination in the Glendale Study Area was completed in (January 1992). The Glendale Study Area RI included a characterization of the nature and extent of contamination, baseline risk assessments, and other RI data for both the north and south plumes. However, separate FS reports evaluating a range of cleanup alternatives for the contaminated groundwater were prepared for each plume. The Glendale South OU FS report and subsequent Proposed Plan were finalized in August 1992 and September 1992, respectively. The Glendale North OU FS report was completed in April 1992 and the Proposed Plan was completed in June 1992.

EPA's preferred alternatives as described in the Proposed Plans were: extraction of 3000 gallons per minute (gpm) of contaminated groundwater for Glendale North and 2000 gpm for Glendale South, treatment of VOCs by air stripping or liquid phase GAC, and conveyance of the treated water to a water purveyor, where it would be blended with water of a quality such that the treated, blended water would meet all drinking water standards, for eventual distribution through a public water system. As a contingency, if all or part of the treated water was not accepted by the purveyors (possibly due to water supply needs), the treated water from Glendale North would be reinjected and for Glendale South would be recharged at the Headworks Spreading Grounds (see Figure 1-2).

In response to comments by the City of Glendale on the Glendale North and South OU Proposed Plans and in order to decrease overall costs associated with the OUs, EPA has determined that the treatment plants for the Glendale North and Glendale South OUs will be combined at one location and the total 5,000 gpm of treated water will be conveyed to the City of Glendale for distribution to its public water supply system. The exact configuration of the combined treatment plant will be determined during the remedial

design phase of the project. The Glendale North OU Record of Decision also reflects this decision to combine the treatment plants.

However, if EPA determines that combining the treatment plants will significantly delay or hinder the implementation of the Glendale South OU, the treatment plants will not be combined. Furthermore, if the City of Glendale does not accept any or all of the treated water (possibly due to water supply needs), any remaining portion of water will be 1) offered to another San Fernando Valley water purveyor or 2) recharged into the aquifer at the Headworks Spreading Grounds.

3.0 ENFORCEMENT ACTIVITIES

In September 1989, EPA signed a cooperative agreement with the State Water Resources Control Board (SWRCB) providing funds for the Regional Water Quality Control Board, Los Angeles Region (RWQCB) to expand its capability to conduct source reduction, identification, and enforcement activities at individual facilities in the San Fernando Valley. Activities include conducting surveys and inspections, and overseeing investigations and remedial activities. The cooperative agreement has been renewed annually since 1989. If RWQCB investigations confirm soil or groundwater contamination at a specific facility, then that facility is referred to EPA. EPA is using the RWQCB's facility-specific information in conjunction with RI data, groundwater and vadose zone modeling results and information gathered from other sources including California Environmental Protection Agency (CAL-EPA) investigations, South Coast Air Quality Management District (SCAQMD) investigations and responses to information request letters, to build enforcement cases.

EPA is and will be using its investigatory resources, enforcement resources and authority under CERCLA in conjunction with the work of the RWQCB to:

- o Identify individuals and companies who are responsible for the historic and current contamination.
- o Compel responsible parties to design, construct and operate treatment facilities and reimburse EPA for prior and any future expenditures at the site.

EPA has issued preliminary notices of potential liability (General Notice) for the Glendale South OU to nineteen parties to date. These parties have been preliminarily identified as owners and operators of twelve facilities located in the vicinity of the South Plume of the Glendale Study area of the San Fernando Valley. EPA anticipates that additional parties will be notified of potential liability. Special notice pursuant to CERCLA §122 has not yet been issued for the Glendale South OU.

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA's preferred alternative, as well as five other alternatives were described in EPA's Proposed Plan for the Glendale South OU (September 1992). The Proposed Plan was in the form of a fact sheet and was distributed to all parties on EPA's mailing list for the San Fernando Valley Superfund sites. The original 30 day public comment period was extended several times for a total comment period of 15 weeks (107 days) after EPA received requests for extensions from members of the public. The public comment period closed on January 19, 1993. EPA received over 250 comments. These comments and EPA's responses to these comments are summarized in Part III (the Responsiveness Summary) of this ROD.

A public meeting was held in the City of Glendale on October 21, 1992, to discuss EPA's preferred alternative and the other alternatives. At this meeting EPA gave a brief presentation regarding the Proposed Plan, answered questions, and accepted comments from members of the public.

During the public comment periods for the Glendale North and Glendale South OUs, the City of Glendale provided comments emphasizing that it would like to receive more than the 3,000 gpm of extracted, treated groundwater proposed under the Glendale North Proposed Plan. The City also indicated that it had stored water credits and water rights sufficient to accept greater than 5,000 gpm of extracted, treated groundwater from the San Fernando Valley. As a result of the City's comments on the Glendale North and Glendale South OUs, and after evaluating the relative total cost of a combined plant versus separate plants, EPA has determined that the treatment plants for the Glendale North and South OUs will be combined and the total 5,000 gpm of treated water will be conveyed to the City of Glendale.

A press release to announce the release of the Proposed Plan was issued October 1, 1992. Notice of the public meeting as well as the availability of the Proposed Plan was published in the Los Angeles Daily News on November 4, 1992. An announcement of the extension of the public comment period was published in the Los Angeles Daily News on December 3, 1992. In addition, two newspaper articles were written about the remedial investigation, the feasibility study and the Proposed Plan for the Glendale South OU including: Los Angeles Times - October 8, 1992 and Los Angeles Daily News - October 22, 1992. A map of the Glendale South OU was provided in the Proposed Plan and the various newspaper articles described the area that would be impacted by the Glendale South OU.

In general, the purpose of EPA's community relations program for the San Fernando Valley project is to inform community members and other interested parties about the Federal activities to address contamination at the hazardous waste sites, as well as to encourage two way communication between the concerned public and

EPA and/or other local agencies.

From March 1987 through December 1991, EPA and LADWP attended quarterly meetings of the Community Work Group (CWG) to discuss technical issues and management strategies involving the San Fernando Valley Superfund project including the interim groundwater cleanup for the Glendale area. The CWG consisted of interested San Fernando Valley community residents, elected officials, agency representatives, and environmental and business leaders. The CWG provided input to EPA on the various components of the Superfund project, including the interim groundwater cleanup of the Glendale area.

The community relations plan for the San Fernando Valley Superfund sites was most recently updated and issued in April 1990. The plan will be revised again in 1993 to address community relations during the remedial design phase of the Glendale South OU interim action, and to document other changes in the community relations program.

5.0 SCOPE AND ROLE OF THE OPERABLE UNIT

The interim remedial action for the Glendale South OU represents a discrete element in the overall long-term remediation of groundwater in the eastern portion of the San Fernando Valley. While the final overall plan for the remediation of the San Fernando Valley Sites has not yet been determined, the objectives of the Glendale South OU are:

- o To inhibit vertical and horizontal migration of groundwater contamination in the South Plume of the Glendale Study Area
- o To begin to remove contaminant mass from the upper zone of the aquifer in the South Plume of the Glendale Study Area.

EPA does not expect these objectives to be inconsistent with, nor preclude, any final action for San Fernando Valley Areas 1, 2, 3 and 4.

The Glendale South OU interim remedy is intended to address the immediate and significant groundwater contamination problem in and beyond a portion of San Fernando Valley Area 2 (also known as the Crystal Springs NPL Site, see Figure 1-1). A more complete investigation of the overall groundwater problem in the San Fernando Valley is being conducted through the basinwide remedial investigation and feasibility study process.

The basinwide groundwater RI Report for the San Fernando Valley Study Area was completed in December 1992. Groundwater wells installed by EPA as part of the basinwide RI are routinely

sampled to continue to monitor the nature and extent of the groundwater contamination in the San Fernando Valley.

EPA is currently using the results of the remedial investigation in basinwide feasibility studies to address VOC contamination in both the groundwater and vadose zone of the eastern portion of the San Fernando Valley.

As part of the basinwide groundwater FS, EPA is revising and recalibrating the basinwide groundwater flow model to incorporate the most recent data. The updated version of the model will be complete in 1993. EPA will then review and evaluate various groundwater remediation options for the basin including: regional pump and treat, well-head treatment, use of innovative technologies and no-further-action alternatives.

EPA has also initiated work on a vadose zone FS to examine ways to protect the groundwater from contaminants that could reach the groundwater in the future. This FS will review and evaluate options for cleanup of VOC contamination in the vadose zone of the San Fernando Valley.

EPA will continue to gather and analyze information important to the project. EPA has been working with the San Fernando Valley water purveyors and the Upper Los Angeles River Area (ULARA) Watermaster to summarize past and future groundwater management in the San Fernando Valley, including an overall water balance for the San Fernando Valley. EPA's interim actions to remove contaminants and inhibit migration from the most contaminated areas in North Hollywood, Burbank, Glendale North, Glendale South and Pollock OUs will also provide information useful for the basinwide FS.

6.0 SUMMARY OF GLENDALE SOUTH OU SITE CHARACTERISTICS

Results of LADWP's groundwater monitoring programs conducted from 1981 through 1987 revealed that TCE and PCE had contaminated approximately 50 percent of the water supply wells in the eastern portion of the San Fernando Valley groundwater basin at concentrations exceeding State and Federal drinking water standards.

The results of recent (1989-1992) EPA sampling of groundwater monitoring wells installed by EPA throughout the San Fernando Valley indicate that TCE and PCE continue to be the principal contaminants of concern. TCE and PCE are industrial solvents commonly used in the metal degreasing and dry-cleaning industries. Both are known animal carcinogens and probable human carcinogens. The Federal MCL for both TCE and PCE is 5 ug/l (ppb). The State MCLs for TCE and PCE are also 5 ug/l (ppb).

There are seven EPA monitoring wells located in the south plume portion of the Glendale Study Area (vertical profile borings

and cluster wells). These wells are: PO-VPB-01, PO-VPB-02, PO-VPB-10, PO-C01-195, PO-C01-354, PO-C02-052, and PO-C02-205. Wells PO-VPB-01, PO-VPB-02 and PO-VPB-10 were sampled initially during November 1989 and PO-VPB-01 and PO-VPB-10 were resampled during August and September 1990. The cluster wells PO-C01 and PO-C02 and were sampled initially in September 1990, at the same time PO-VPB-02 was resampled. The following discussion summarizes the results of chemical analyses on the sampling events in August and September 1990.

In the four Upper Zone wells (the three PO-VPBs and PO-C02-052), six VOCs were detected above Federal and/or State MCLs: carbon tetrachloride; 1,2-Dichloroethane (1,2-DCA); 1,1-dichloroethene (1,1-DCE); 1,1,2,2-tetrachloroethane; PCE; and TCE (see Table 6-1). As reported in the FS Report for the Glendale South OU, TCE was detected in three of the four Upper Zone wells in the south plume at a maximum concentration of 820 ppb. PCE was also detected in three of the four Upper Zone wells at a maximum concentration of 140 ppb (see Table 6-1, Figure 6-1 and Figure 6-2).

In the three Lower Zone wells (PO-C01-195, PO-C01-354 and PO-C02-205), the only VOC detected was TCE at a maximum concentration of 4 ppb.

Monitoring wells have been installed at industry facilities in the Glendale south plume portion of the Glendale Study Area. These include three wells at the A.G. Layne facility, seventeen wells at the Philips Components facility and nine wells at the former Franciscan Ceramics facility. All of these wells are screened in shallow groundwater and are discussed as Upper Zone wells.

Nine VOCs (benzene, toluene, total xylenes, 1,1-DCA, 1,1-DCE, 1,1,1-TCA, methylene chloride, PCE and TCE) were detected above MCLs at the A.G. Layne facility wells based on samples collected in July 1990. Samples collected in August 1990 at the Philips Components wells show PCE, TCE, methylene chloride and vinyl chloride above MCLs.

Four base, neutral, and acid extractable semi-volatile organic compounds (BNAs), 2-methylnaphthalene, naphthalene, 2,4-dimethylphenol, and 2-methylphenol, were detected in the A.G. Layne wells. Two BNAs, bis(2-ethylhexyl)phthalate and di-n-octylphthalate, were detected in one of the Lower Zone EPA wells (none in Upper Zone sampling). No State or Federal MCLs have been promulgated for these compounds. No chlorinated pesticides or PCBs were detected in the Upper or Lower Zones.

Nitrate has been detected at levels in excess of the MCL in the some of the groundwater samples collected in the South Plume of the Glendale Study Area (see Table 6-1, and Figure 6-3). Nitrate was detected in all of the VPB and cluster wells at concentrations ranging from 9.55 to 16.1 mg/l (as nitrogen). The Federal MCL is

TABLE 6-1

**SUMMARY OF ALL DETECTED CONSTITUENTS IN THE UPPER ZONE RI WELLS
FOR THE SOUTH PLUME OU
(Page 1 of 2)**

Constituent	MCL ^a	Minimum Concentration	Maximum Concentration	Number of Wells With Detects out of 4 ^d
Volatile Organic Compounds (µg/l)				
Carbon Tetrachloride	0.5	--	1	1
Chloroform	100 ^c	--	1	1
1,1-Dichloroethane	5.0	--	1	1
1,2-Dichloroethane	0.5	3	5	2
1,1-Dichloroethene	6.0	--	41	1
1,1,2,2-Tetrachloroethane	1.0	--	9	1
Tetrachloroethene (PCE)	5.0	3	140	3
1,1,1-Trichloroethane (TCA)	200	--	11	1
Trichloroethene (TCE)	5.0	23	820	3
Semivolatile Organics (µg/l)				
2-Methylnaphthalene	-- ^b	--	110	1
Naphthalene	-- ^b	--	160	1
2,4-Dimethylphenol	-- ^b	--	16	1
2-Methylphenol	-- ^b	--	16	1
Priority Pollutant Metals (mg/l)				
Arsenic	0.05	--	0.005	1
Chromium	0.05	--	1.2	1
Mercury	0.002	--	0.0004	1
Nickel	-- ^b	--	0.06	1
Selenium	0.05	--	0.007	1
Silver	0.05	--	0.005	1
Zinc	-- ^b	0.03	0.051	4
Inorganic Compounds (mg/l)				
Nitrate (as N)	10	9.55	16.1	4
Total Dissolved Solids (TDS) By Addition	500	458	693	4

**SUMMARY OF ALL DETECTED CONSTITUENTS IN THE UPPER ZONE RI WELLS
FOR THE SOUTH PLUME OU
(Page 2 of 2)**

Constituent	MCL ^a	Minimum Concentration	Maximum Concentration	Number of Wells With Detects out of 4 ^d
Radionuclides (pCi/l)				
Gross Alpha	15	2.2 ± 2.5	4.5 ± 4.8	4
Gross Beta	50	5.0 ± 2.0	8.2 ± 1.7	4
Radon	-- ^b	66 ± 4.1	480 ± 5.4	4

Note: Samples collected August and September 1990.

^a Promulgated federal or state MCL, whichever is more stringent.

^b No state or federal MCL promulgated.

^c MCL is for the sum of trihalomethanes.

^d The shallow wells include PO-VPB-01, PO-VPB-02, PO-VPB-10, and PO-C02-52.

